

INTEGRATED HEALTH IMPACT ASSESSMENT OF WASTE MANAGEMENT IN LAZIO (ITALY)

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Background and Aims: the management of municipal solid waste (MSW) may entail health effects difficult to be quantified. We evaluated potential health impacts arising from MSW management under a 2008 baseline scenario (BS) and an alternative 2016 green scenario (GS) which includes decrease in waste production, increase in recycling, clean transportation, and no landfilling without pre-treatment.

Methods: we evaluated the population of the Lazio region in Italy (5.5 million inhabitants). Pollutants concentrations from transport, incineration, and combustion of landfills biogas were modelled using the ADMS-Urban model. Population-weighted exposure levels were calculated. Concentration-response functions were derived from systematic reviews of the literature. Cancer incidence (CI), low-birth weight (LBW) newborns, congenital anomalies (CA), respiratory symptoms (RS) and odour annoyance (OD), Years of Life Lost (YLL), and Disability Adjusted Life Years (DALYs) were estimated for the period 2016-2050.

Results: at the BS, 36,191 people lived nearby MSW facilities, while 14,606 were estimated under the GS. Waste transport health impact was estimated in 561 YLL at BS, 29 under the GS. For incinerators, CI was 7.5 (BS) and 2.5 (GS) cases. 10 YLLs were estimated at BS whereas 9.6 for GS. For landfills, LBW cumulative incidence was 8.3 cases (BS) and 2.8 (GS), respectively. The cumulative incidence of CA was 0.3 (BS) and 0.1 (GS) cases. The health impact as YLL was 17.9 (NO₂) at BS and 12.4 with GS. At the BS the prevalence of severe OD and RS were the same, 54 and 424, respectively while a decrease to 19 and 147 were predicted with the GS. About 3000 and 1600 DALYs were estimated under the two scenarios. The largest contribution to DALYs was from RS (about 90%) and OD.

Conclusions: although MSW management impact on health is moderate, a substantial improvement can be realized with a green waste policy.